

Message Text

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SUBJECT: TARBELA DAM SITUATION

REF: ISLAMABAD 10154; MEMCON NOV 5, 1974

SUMMARY. ACCORDING TO AN AMERICAN CONTRACTOR AT TARBELA, DAMAGE TO TUNNEL NO. 2 IS MORE EXTENSIVE THAN ANTICIPATED. IT IS BY NO MEANS CERTAIN IT CAN BE REPAIRED BEFORE THE SPRING SNOW MELT. END SUMMARY.

1. ON NOVEMBER 20 LESLIE BUTTERFIELD, PROJECT ADMINISTRATOR FOR THE CHICAGO BRIDGE AND IRON COMPANY CONTINGENT AT TARBELA, CALLED AT THE EMBASSY ON ANOTHER MATTER AND DURING HIS VISIT PROVIDED THE ECON COUNSELOR WITH A USEFUL RUNDOWN ON THE TARBELA SITUATION. MR. BUTTERFIELD'S COMPANY IS RESPONSIBLE FOR MOST OF THE STEEL PLATING WHICH LINES THE TUNNELS AT THE DAM.

2. BUTTERFIELD SAID THAT OF THE VARIOUS REPAIRS TO BE DONE TO THE DAM, ALL BUT THOSE TO TUNNEL NO. 2 SHOULD BE EASILY COMPLETED BEFORE MAY. REPAIRS TO TUNNELS NOS. 3 AND 4 ARE RUNNING ON SCHEDULE AND SHOULD BE FINISHED BY NEXT MONTH.

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TUNNEL NO. 1 IS BEING USED TO CHANNEL OUT ALL THE INDUS

RIVER FLOW AND LITTLE DAMAGE IS BELIEVED TO EXIST THERE. REPAIRS TO THE SO-CALLED "IMPERVIOUS BLANKET" COVERING THE BED OF THE RESERVOIR IMMEDIATELY UPSTREAM FROM THE DAM WILL BE EASILY FINISHED BY APRIL.

3. THE SITUATION AT TUNNEL NO. 2 IS ANOTHER MATTER. INSPECTION OF THE TUNNEL HAS REVEALED MUCH CAVITATION IN THE CONCRETE ALONG HALF OF THE TUNNEL'S 2,600 FOOT LENGTH. IN ADDITION, THE TARBELA PEOPLE WERE ASTONISHED TO FIND DEEP INSIDE THE TUNNEL A BOULDER 20 FEET WIDE STUCK IN THE HOLE, BEHIND WHICH WERE OTHER BOULDERS PILED UP. THESE WILL HAVE TO BE BROKEN UP AND REMOVED, AND REPAIRS MADE TO THE GOUGED WALLS, INCLUDING THE 200-FOOT SECTION NEAR THE ENTRANCE WHICH HAS CAVED IN. THE BOULDERS APPARENTLY ENTERED THROUGH THE CAVED-IN SECTION.

4. ADDING TO THE PROBLEMS OF TUNNEL NO. 2 IS RECENTLY DISCOVERED SERIOUS DAMAGE TO THE WATER-INTAKE TOWER HIGH ABOVE THE RIVER LEVEL ENTRANCE TO THE TUNNEL. APPARENTLY WHEN THE 200-FOOT SECTION OF THE TUNNEL COLLAPSED, AIR AND WATER PRESSURE INSIDE THE TUNNEL LIFTED THE HEAVY 20-FOOT HIGH INTAKE CAP ON THE TOWER AND TWISTED IT AROUND ONE FOOT. AS A CONSEQUENCE, THE INTAKE IS UNUSEABLE AND WILL PROBABLY HAVE TO BE REMOVED AND REPLACED.

5. WHEN ASKED WHAT BROUGHT ABOUT THE DAMAGE TO TUNNEL NO. 2, BUTTERFIELD SAID THAT ALTHOUGH DOZENS OF EXPERTS HAVE BEEN BROUGHT IN TO PASS JUDGMENT ON THIS AND EACH SEEMS TO HAVE A SOMEWHAT DIFFERENT OPINION, THE CONSENSUS OF MANY RESIDENT ENGINEERS AT THE SITE IS AS FOLLOWS. IT IS THAT THE DAMAGE OCCURRED BECAUSE OF UNFORTUNATE DECISIONS BY BOTH THE GOP AND THE AMERICAN ENGINEERING CONSULTANTS TAMS. WHAT ALLEGEDLY HAPPENED WAS THAT AFTER THE RIVER-LEVEL GATES TO TUNNEL NO. 2 HAD BEEN CLOSED AS SCHEDULED (PERMANENTLY IT WAS THOUGHT), THEREBY ALLOWING THE RESERVOIR TO FILL UP (WITH WATER THEREAFTER ONLY TO FLOW INTO THE TUNNEL THROUGH THE HIGH INTAKE TOWER), THE GOP ORDERED THE GATES REOPENED. THEY DID THIS TO KEEP THE RESERVOIR LEVEL LOW FOR SOME TIME LONGER SO AS TO GIVE THE GOP MORE TIME TO REMOVE VILLAGERS FROM THE AREA TO BE FLOODED BY THE RESERVOIR. HAD THE GOP MOVED THE VILLAGERS EARLIER

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AS PER SCHEDULE (APPARENTLY THE VILLAGERS RESISTED BEING MOVED), NO PROBLEM WOULD PROBABLY HAVE EVER OCCURRED TO TUNNEL NO. 2.

6. WHERE TAMS ALLEGEDLY MADE ITS MISTAKE WAS TO COMPLY WITH THE GOP REQUEST TO REOPEN THE RIVER-LEVEL GATES, WHICH GATES WERE NOT DESIGNED TO BE OPENED ONCE THEY WERE CLOSED. THE THREE GATES WERE NEVERTHELESS SUCCESSFULLY

RAISED THEREBY ALLOWING THE GOP MORE TIME TO MOVE THE VILLAGERS. BUT WHEN IT CAME TIME TO LOWER THEM AGAIN, ONLY TWO OF THE THREE GATES TO TUNNEL NO. 2 FELL BACK INTO POSITION. THE THIRD STUCK HALF WAY, THEREBY ALLOWING WATER TO CONTINUE TO ENTER THE TUNNEL THROUGH THIS PARTIAL OPENING. THIS WATER FLOW INTO THE PARTIAL OPENING CREATED A DANGEROUS VACUUM AND A POWERFUL TURBULENCE INSIDE THE TUNNEL WHICH WAS OF SUCH TREMENDOUS FORCE AS TO ERODE THE TUNNEL WALLS AND IN TIME CAUSE THE COLLAPSE OF THE 200-FOOT LONG SECTION.

7. IN ADDITION TO REPAIRS WHICH ARE GOING ON TO TUNNELS NOS. 2, 3 AND 4, REPAIRS ARE ALSO BEING MADE TO THE CLAY "IMPERVIOUS" BLANKET COVERING THE BED OF THE RESERVOIR JUST BEHIND THE DAM, FOR THE PURPOSE OF REDUCING SEEPAGE UNDER THE DAM. WHEN THE RESERVOIR WAS FILLED LAST SUMMER, THE AMOUNT OF SEEPAGE, WHILE WITHIN THE ALLOWABLE TOLERANCES, WAS NEVERTHELESS MORE THAN CONSIDERED GOOD. BUTTERFIELD SAID THAT YOU CAN SPOT CRATERS AS DEEP AS 20 FEET IN THE BLANKET WHERE SEEPAGE OCCURRED. REPAIRS ARE NOW BEING DONE TO THESE CRATERS AND FURTHERMORE THE CLAY BLANKET IS BEING EXTENDED FURTHER UPSTREAM. THESE MEASURES ARE EXPECTED TO BE COMPLETED BEFORE MAY AND HOPEFULLY THE SEEPAGE WILL BE REDUCED SIGNIFICANTLY WHEN THE RESERVOIR FILLS UP AGAIN.

8. BUTTERFIELD SAID THAT FOR PUBLIC CONSUMPTION MOST SENIOR OFFICIALS AT THE SITE EXPRESS OPTIMISM THAT ALL DAMAGE CAN BE REPAIRED BEFORE THE SPRING MELT. PRIVATELY MANY KNOWLEDGEABLE ENGINEERS THERE BELIEVE IT IS GOING TO BE A VERY CLOSE THING WITH REGARD TO TUNNEL NO. 2. HE PUT THE CHANCES AS NO BETTER THAN 50 PERCENT. HE SAID THE LATEST ESTIMATE OF THE COST OF REPAIRS THAT HE HAD HEARD TOTALED ABOUT \$50 MILLION, MADE UP OF ABOUT \$35 MILLION LIMITED OFFICIAL USE

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FOR TUNNEL NO. 2, \$12 MILLION FOR THE BLANKET, AND \$3 MILLION FOR OTHERS.

COMMENT. MISSION OFFICERS PLAN TO VISIT TARBELA NEXT WEEK AND SHOULD BE ABLE TO CONFIRM, CORRECT OR UPDATE BUTTERFIELD'S REPORT. FOR THE MOMENT, WE BELIEVE BUTTERFIELD'S REPORT PLAUSIBLE AND PROBABLY LARGELY CORRECT. END COMMENT. BYROADE

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